

Skin in the game, wealth and risk-taking: Evidence from private equity funds

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Motivation: compensation contracts in the PE industry

- Compensation designed to align incentives of manager (GP) with those of investors (LPs)
- Structure typically option-like with a fixed fee (2%) and an upside (20% carry)
- But option-like payoffs could increase managers' risk-appetite too much (Knopf et al, 2002; Tchisty et al, 2011)
- To mitigate risk-taking incentives, GPs are asked to coinvest in the PE fund
- Does such “skin in the game” reduce GP risk taking?

This paper: GP coinvestment and risk-taking

We investigate effect of GP coinvestment on risk-taking in PE

- Focus on two dimensions of risk: project (portfolio company) risk and leverage
- Take GP's wealth into account
 - Coinvestment (in %) is determined at fund raising, while wealth changes over time
- We develop a simple model of the GP's investment decision
- Test the predictions of the model on a sample of Norwegian private equity investments
 - Norwegian setting allows us to exploit data on GPs' wealth

The model setup: project payoffs and financing

Project choice combined with capital-structure decision

- PE manager invests I , choosing from firms with different risk
- Three possible outcomes: $R + \Delta$, R , and $R - \rho$, with $\Delta > \rho$ and probabilities $0.5q$, $(1 - q)$, $0.5q$
- Higher q implies higher risk
- Firm value is increasing in risk: $V = R + 0.5q(\Delta - \rho)$
- Investment I can be financed with debt (D), from competitive loan market, or equity ($I - D$) from PE fund
- We consider debt levels which lead to default and reputational losses for GP in the low state ($B = f(D)$; $f' > 0$)

The model: GP compensation and incentives

- GP is risk averse: faces costs of higher risk ($k = k(q, \text{wealth})$ with $\partial k / \partial q > 0$ and $\partial k / \partial \text{wealth} < 0$).
- Two elements of GP's compensation:
 - **Carried interest** α with hurdle, allowing the GP to participate proportionally in upside (medium and high states)
 - **Coinvestment** β , allowing GP to participate proportionally in net firm value
- GP trades off two types of risks:
 - **Project risk**: Higher q leads to higher expected return, but more downside (bankruptcy) risk
 - **Leverage**: Higher D leads to higher expected carry, but greater expected costs of bankruptcy

Model predictions

The two risks turn out to operate in opposite directions

- Higher coinvestment β leads the GP to:
 - Choose less risky projects ($dq/d\beta < 0$)
 - Financed with higher leverage ($dD/d\beta > 0$)
- A higher level of wealth reduces risk aversion and operates in the opposite direction:
 - Higher project risk and lower leverage

Prediction (combined): Higher relative (wealth-adjusted) GP coinvestment leads to lower project (asset) risk and higher leverage

Data

- Sample of 62 Norwegian portfolio company investments made by 11 PE firms across 20 funds, 1998-2008
 - Fee information provided by a large institutional investor
- Portfolio company financial statements and ownership from Norwegian corporate registry
- Leverage measured at group level (taking holding company structure into account)
- Asset betas from public companies matched on industry, profitability, size, fixed asset ratio, and year
- PE partners and associates identified from fund websites
- Wealth data obtained from Norwegian tax authorities

Summary statistics: GP coinvestment and risk measures

	N	Mean	Median	Std.dev.	Min	Max
<i>GP coinvestment:</i>						
Absolute GP Inv (%)	62	3.7	1.5	4.9	0	15.0
Absolute GP Inv (\$ mill.)	62	13.0	5.9	20.7	0	88.3
Relative GP coinvestment	62	0.93	0.48	1.33	0	5.0
<i>Firm characteristics:</i>						
Asset Beta	62	0.47	0.46	0.30	-0.29	1.24
Leverage Ratio	62	0.62	0.64	0.28	0.02	1.32
Total Assets (in \$m)	62	120	67	223	2.1	1717

Univariate statistics: Split by asset beta and leverage

Average relative (wealth-adjusted) GP coinvestment

	<u>High leverage</u>	<u>Low leverage</u>
High asset beta (project risk)	1.07 [15]	0.48 [17]
Difference in mean		-0.95** (0.048)
Low asset beta (project risk)	1.43 [16]	0.76 [14]

Prediction: High coinvestment → low project risk and high leverage

Coinvestment and project choice (asset beta)

Relative GP coinvestment	-0.049*	-0.046**		
	(0.023)	(0.021)		
Absolute GP inv. (\$M)			-2.8e-10	
			(3.32e-10)	
Absolute GP inv (%)				0.108
				(0.87)
Firm characteristics	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro controls	Yes	No	No	No
Year dummies	No	Yes	Yes	Yes
Observations	62	62	62	62
R-squared	0.18	0.35	0.32	0.32

- Relative GP coinvestment **negatively** associated with **asset beta**
- Absolute GP coinvestment in \$ and % insignificant

Coinvestment and leverage

Relative GP coinvestment	0.070*	0.088**		
	(0.036)	(0.035)		
Absolute GP inv. (\$)			-8.62e-10	
			(5.74e-10))	
Absolute GP inv. (%)				-1.895
				(1.225)
Firm controls	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Macro controls	Yes	No	Yes	Yes
Year dummies	No	Yes	No	No
Observations	62	62	62	62
R-squared	0.24	0.46	0.22	0.23

- Relative GP coinvestment **positively** associated with **leverage**
- Absolute GP coinvestment in \$ and % insignificant

Coinvestment and equity beta

Relative GP coinvestment	-0.15*** (0.028)	-0.17*** (0.041)		
Absolute GP inv. (\$)			4.81e-10 (7.77e-10)	
Absolute GP inv. (%)				1.178 (1.905)
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	No	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Year Dummies	No	Yes	No	No
Observations	62	62	62	62
R-squared	0.29	0.45	0.20	0.20

- Relative GP coinvestment **negatively** associated with **equity beta**
→ overall lower fund risk-taking
- Again, absolute GP coinvestment (\$ and %) insignificant

Coinvestment and “ticket size” (investment-to-fund ratio)

Relative GP coinvestment	-0.070** (0.028)	-0.068** (0.028)		
Absolute GP inv. (\$).			2.50e-10 (6.50e-10)	
Absolute GP inv. (%)				2.072* (0.96)
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	No	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Year Dummies	No	Yes	No	No
Observations	62	62	62	62
R-squared	0.72	0.79	0.69	0.71

- Relative GP coinvestment **negatively** associated with **ticket size**
- Another channel for risk reduction!

Summary

We examine effect of **GP coinvestment** on **risk-taking** in PE funds

- We show in a simple model that **project risk falls** and **leverage increases** with relative (wealth-adjusted) GP coinvestment

We take the model predictions to the data show find that:

- Portfolio company **asset beta**, **equity beta**, and **ticket size decrease** with the relative GP coinvestment
- **Leverage increases** with the relative GP coinvestment
- The absolute coinvestment (\$ or %) is unrelated to risk-taking
 - GP wealth cannot be ignored when examining incentive effects